have led to much controversy among both developers and landowners in the area. Many species in South Africa, especially those that are listed as Data Deficient or have a taxonomic problem, have to be addressed urgently to gain more accurate and reflective Red Lists.

doi:10.1016/j.sajb.2008.01.033

Effect of provenance on chilling sensitivity of recalcitrant seeds, putatively of a single species

V. Bharuth, P. Berjak, N.W. Pammenter
School of Biological and Conservation Sciences, University of KwaZulu-Natal, Howard College Campus, South Africa

Recalcitrant seeds are desiccation sensitive and may be chilling sensitive. However, our studies have indicated that seeds of *Ekebergia capensis* from northerly provenances may be markedly chilling sensitive, while those from further south are less so. In this study, the effects of chilling on viability, selected biochemical aspects and ultrastructure of seeds of *E. capensis* were investigated after storage under hydrated conditions at chilling (1, 3, 6 °C) and non-chilling temperatures (16 °C). The chilling sensitivity of seeds from Tanzania > northern KZN > eastern Cape. Whereas those from eastern Cape retained 80% viability after 12 weeks at 1 °C, at the other extreme, viability of all the seeds from Tanzania was lost after 6 days at 3 °C. Although the species is classified as *Ekebergia capensis* irrespective of provenance, analysis of the nuclear ribosomal ITS1 region of the DNA revealed distinct separation among the populations.

doi:10.1016/j.sajb.2008.01.034

Colonizing a desert wetland: Population history of the Nile crocodile in south-central Africa represents a biotic signature from an ancient palaeo-lake

J.M. Bishop[a], P. Aust[c], F.P.D. Cotterill[d], A.J. Leslie[a], C.O. 'Ryan[b]
[a]*Department of Conservation Ecology and Entomology, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa*
[b]*Evolutionary Genetics Group, Department of Molecular and Cell Biology, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa*
[c]*Division of Biology, Faculty of Life Sciences, Imperial College London, Silwood Park, Ascot, Berkshire SL5 7PY, United Kingdom*
[d]*Africa Earth Observatory Network (AEON), Department of Geological Sciences, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa*

The Nile crocodile, *Crocodylus niloticus*, is a dominant predator of rivers and wetlands in sub-Saharan Africa. In this study, we integrate analyses of microsatellite loci and mitochondrial DNA sequences to investigate the phylogeographic history of the Nile crocodile in the Okavango Delta and neighbouring Upper Zambezi and Chobe Rivers. This study asks whether populations presently confined to these wetlands reflect influences of landscape evolution across this dynamic drainage basin. Although the Okavango Delta is maintained primarily by seasonal inflow from the Angolan highlands, it retains ephemeral links with neighbouring drainage systems originally shared during the Plio-Pleistocene. Thus, we were especially interested to test for evidence of historic gene flow across these wetlands. Microsatellite data suggests the presence of significantly differentiated lineages within the separate drainage systems while analysis of control region sequences indicates a sustained period of population growth across the region that peaked around one million years bp. This discovery suggests that extant populations of crocodiles in the Delta and neighbouring rivers represent the vestiges of a much larger population, which originally exploited the ancient Palaeo-Lake Makgadikgadi (PLM). Archaeological and geological evidence constrains the tenure of PLM to the late Pliocene and early Pleistocene, and reveals its desiccation initiated at least 500 Kya. We propose a model where extant lineages are remnants of dispersal events that occurred during periods of increased flooding. This process likely consisted of a series of demographic changes that occurred over hundreds of thousands of years as wetlands became intermittently linked, allowing crocodiles to move between what are today isolated systems.

doi:10.1016/j.sajb.2008.01.035

Size class structure of three commonly traded bulbs at Faraday (Johannesburg) *umuthi* market: Implications for sustainability

V.J. Brueton, V.L. Williams, E.T.F. Witkowski
School of Animal, Plant and Environmental Science, University of the Witwatersrand, Private Bag 3, Johannesburg 2050, South Africa

Resource harvesting can drive plant populations to extinction if harvesting increases to chase dwindling yields. The effect of trade on medicinal bulb species is poorly known, however by examining medicinal markets as centres of trade, the effects of trade on plant populations can be determined. Size class distributions allow identification of poorly represented life history stages and may also indicate declining recruitment. Ten samples of *Boophone disticha, Bowiea volubilis* and *Drimia altissima* were purchased from Faraday *umuthi* (Johannesburg) market in 2007. The relationships between (a) mass and diameter and (b) mass/sale and cost price (Rand/kg) were determined. The size class distributions of all three species were also determined. The size class distribution for *B. volubilis* did not follow a normal distribution (K–S $d=0.22240$; $P<0.01$) and was skewed by numerous small and a few medium sized bulbs. Hence the trade is negatively affecting the population of this species. In comparison to the other species, the number of bulbs per sale is high for *B. volubilis*, while the mass per sale is low. For all three species there was a positive and disproportionate relationship between diameter and mass and an inverse and disproportionate relationship between mass/sale and Rand/kg. Trade in medicinally used bulbs can have a negative impact on commonly traded species. These impacts are influenced by species specific growth rates, survival rates and responses to harvesting. Continued monitoring of commonly used species is needed to prevent further negative impacts.

doi:10.1016/j.sajb.2008.01.036

Systematic studies in the genus *Lebeckia* and related genera (Crotalarieae, Fabaceae): A new generic classification for *Lebeckia*

J.S. Boatwright[a], M.M. Le Roux[a], M. Wink[b], P.M. Tilney[a], B-E. Van Wyk[a]
[a]*Department of Botany and Plant Biotechnology, University of Johannesburg, PO Box 524, Auckland Park 2006, South Africa*
[b]*University of Heidelberg, Institute for Pharmacy and Molecular Biotechnology, Im Neuenheimer Feld 364, 69120 Heidelberg, Germany*

The genus *Lebeckia* is a group of papilionoid legumes that occur throughout the Cape and extend northwards into the south-western parts of Namibia. It comprises ca. 36 species which are currently accommodated in four sections, viz. *Calobota*, *Lebeckia*, *Stiza* and *Viborgioides*, and one as yet unplaced species, *L. inflata*. Analyses of the internal transcribed spacer (ITS) of nuclear ribosomal DNA and plastid *rbcL* sequences of 175 samples representing all major lineages of the tribe Crotalarieae indicate that *Lebeckia* is paraphyletic. These analyses, along with morphological and anatomical data, suggest that the genus should be divided into three genera, viz. *Lebeckia* s.s. (*L.* sect. *Lebeckia*), *Calobota* (*L.* sect. *Calobota* and *L.* sect. *Stiza*) including the monotypic genus *Spartidium* and *Acanthobotrya* (*L.* sect. *Viborgioides*, *L. inflata* and *L. mucronata*). Informative characters supporting these groups were found to be a combination of habit, bark formation on twigs, leaf type and anatomy, and anther configuration. These characters, along with the results from the DNA sequence data, will be discussed.

doi:10.1016/j.sajb.2008.01.037